

## Minutes from the Salton Sea Air Quality Working Group Meeting on January 11, 2006

**ATTENDEES:** Chuck Keene/DWR  
Vic Nguyen/DWR  
Carrie MacDougall/CH2M HILL  
Summer Bundy/CH2M HILL  
Elliot Mulberg/ARB  
Brad Poirez/ICAPCD  
Reyes Romero/ICAPCD  
Mark Sweeney/DRI  
Phadrea Ponds/USGS  
Vickey Doyle/IID  
Pamela Vanderbilt/CH2M HILL  
John Scott/MWD  
Santiago Perales/Torres  
Martinez Tribe  
Susan Yogi/SDCWA  
Cheryl Rodriguez/USBR  
Pat Cooper/Office of Senator  
Ducheny  
Jeff Harvey/HCG for SDCWA  
John Dickey/CH2M HILL  
Laura Washburn/Salton Sea  
Coalition  
Al Kalin/Imperial County Farm  
Bureau

**FROM:** John Dickey/CH2M HILL  
Pamela Vanderbilt/CH2M HILL

**DATE:** January 11, 2006

### 9:30 Welcome and Introduction (Chuck Keene/DWR, All)

Chuck reminded the group that all air quality reports and materials from meetings are posted on the DWR web site for the Salton Sea Ecosystem Restoration Study (ERS):

<http://www.saltonsea.water.ca.gov>

Also, an inflows factsheet is being developed and will be posted on the web shortly.

Chuck went over the proposed meeting agenda and asked if there were other items to add. Jeff Harvey asked that we add discussion of the Salton Sea Authority memorandum dated January 6, 2006, titled, "Follow-up on the Salton Sea Advisory Committee Meeting on December 8, 2005". Copies were distributed to the meeting attendees that had not previously seen the memorandum.

Brad Poirez, ICAPCD, provided copies of a letter signed by the Imperial County Board of Supervisors, regarding "Statement of Imperial County APCD and County of Imperial Concerning Salton Sea Air Quality Issues", to respond to the Salton Sea Authority memorandum.

### 9:45 Alternatives Update, including No Action Alternative (Summer Bundy/CH2M HILL)

Summer presented information on the 6 alternatives (including No Action) discussed at the Salton Sea Advisory Committee Meeting on December 8, 2005. There was extensive

discussion of State's commitment to air quality management, and the allocation of water for this purpose. Main points were as follows:

- The no action alternative does not include air quality mitigation in exposed areas between the current sea level (approximately -227 feet msl) and -235 feet msl. This "baseline" area would have been exposed even without the IID water transfer. The approach to mitigation below -235 feet would be consistent with the 4-step process for air quality mitigation outlined in the IID Water Conservation and Transfer EIR/EIS.
- For the action alternatives, the State would plan to restore ecosystem elements and mitigate all exposed areas below the existing shoreline (approximately -227 feet msl). Much of the construction of infrastructure and habitat under the alternatives would occur in the area between -227 and -235 feet. However, depending on the alternative selected (eg, Minimum Barrier Alternative), additional infrastructure components may be required as the Sea recedes. Under the action alternatives, the approach to air quality mitigation would also be consistent with the 4-step process for mitigation.
- Legislation requires that the Secretary recommend the alternative that best meets goals related to habitat, water quality, and air quality. For air quality, the goal is an alternative that "eliminates" air quality impacts associated with the restoration program "to the maximum extent feasible". The Resources Agency has taken this to require the following in all action alternatives:
  - Commitment to mitigate emissions from all playa areas that become emissive. For the purposes of this discussion, emissive areas are defined as those exposed areas that would release fugitive dust emissions at levels sufficient to cause or contribute to violation of an ambient air quality standard. The upper limit on the State's commitment for air quality management (AQM) is 100% of the exposed playa area, should 100% of the exposed area prove to require controls. This would represent "worst case conditions".
  - A defensible basis for program infrastructure and water balance requires an estimate of water demands (and therefore exposed, emissive areas) for future dust control. Few exposed playas are available as examples for determining levels of emissiveness and control requirements. The most severe condition currently recognized is at Owens Lake, where the 2003 SIP required that approximately 33% of exposed area must be "controlled". Recent proposals by Great Basin Air Quality Management District (AQMD) for Owens Lake would, if implemented, increase the area requiring controls to a level closer to 50%. With few other available points of reference, the ERS water balance and infrastructure planning estimate has been based on the assumption that 50% of the exposed playa would be emissive and would require proven emissions control methods, in this case, installed, irrigated dust control measures (e.g., water-efficient vegetation). Reyes Romero, ICAPCD, pointed out that methods proven for dust control at Owens Lake, such as shallow flooding and water-efficient vegetation, would currently represent best available control measures, as required by the Clean Air Act in the serious PM10 nonattainment area.
  - The 50% assumption for water demand does not pre-empt the ERS commitment to control all areas that prove to require emissions controls. The current assumption is

that the other 50% of the exposed playa would either be non-emissive, or if emissive, these acres would be controlled through "waterless", but equally effective, control measures, to be verified in future studies.

- Should additional water (over and above the amount projected in the water balance) be required for dust control, allocation of this water and development of the associated infrastructure would likely require additional environmental study and documentation. Physically, the most likely scenario currently appears to be adaptive management of available water, shifting use of some of the available water from habitat to air quality. An acre of habitat is estimated to require approximately 7 acre-feet per year, whereas an acre of water-efficient vegetation is estimated to require approximately 1 acre-foot per year. Using these estimates, for every 1 acre of habitat eliminated from an ERS alternative, water sufficient for 6 additional acres of dust mitigation, plus dust mitigation for the eliminated acre of habitat, would be available.
- All action alternatives share a common approach to AQM, including 1) the process for developing water- and cost-efficient, effective, and reliable control, 2) the level of commitment for deploying control, 3) short- and long-term monitoring of exposed playa, emissions, and air quality, and 4) integration with the 4-step process for air quality mitigation outlined in the IID Water Conservation and Transfer EIR/EIS.

Chuck mentioned that some "pilot" studies, such as those for habitat or air quality mitigation, could be implemented prior to 2015.

There was discussion of inflow assumptions, and the potential for additional future water transfers. Al Kalin mentioned an additional risk of concern to area farmers, that being the possibility that the USBR might undertake a "417 Proceeding" to take away water rights if farmers don't use water efficiently.

For some alternatives, construction air quality impacts may be significant, even with use of clean equipment and implementation of mitigation measures. There are other environmental and engineering issues with project features, such as barriers. Sources, availability, costs, and transport of rock (for example, using conveyor systems) for the construction of the barriers required under some of the alternatives were discussed.

The regulatory, engineering, and financial feasibility of some of the alternatives (i.e., those containing barriers) was questioned. Chuck clarified that, in spite of these issues, a relatively full slate of alternatives is being developed and analyzed for public review. Selection of a preferred alternative will only take place after stakeholders have an opportunity to review and comment on the full slate. The Salton Sea Advisory Committee has indicated that there is benefit to retention and stakeholder study and review of the full slate, rather than an early screening of alternatives on the basis of feasibility.

Water balance and phasing slides and graphics were presented by Summer. Assuming a start date of January 1, 2007, the first phase is about 9 years for environmental studies, permitting, design, financing, and bid procurement. Actual construction may take between 7 to 20 years. DWR is working on the models that will allow evaluation of the phasing of the various alternatives, including water use and availability, exposed playa, and construction of various infrastructure and project elements. The Habitat Working Group

has been discussing the timing of benefits vs. the timing of impacts. Earlier phasing of off-site habitat enhancements and air quality management measures may be needed to get mitigation out in front of impacts.

A color copy of Summer's presentation will be posted on the DWR web site.

The summary table (alternatives and assumptions) that was drafted on the white board at the meeting is attached at the back of these minutes.

#### **11:00 Status Update on Emissions Inventories, SIPs, Regulations (ICAPCD, SCAQMD)**

ICAPCD:

Brad Poirez, ICAPCD, described the background and intent of the letter signed by the Imperial County Board of Supervisors, regarding "Statement of Imperial County APCD and County of Imperial Concerning Salton Sea Air Quality Issues".

With regard to the memorandum from Salton Sea Authority, and the Imperial County response letter, Chuck indicated that DWR has offered to meet with Ron Enzweiler, and that the comments on the ERS in the memorandum will be responded to in the ERS and PEIR.

The Regulation VIII series of rules for fugitive dust control were adopted by the ICAPCD Board on November 8, 2005. The rules are immediately effective for new sources, and for existing sources, the effective date will be February 8, 2006.

The PM10 emissions inventory being prepared by ENVIRON for ICAPCD is still in draft form, and the draft comments from ARB have not yet been finalized or addressed. The new emissions inventory, including fugitive dust from barren lands, is unlikely to be available in PEIR timeframe. EPA has not yet published a due date for the Imperial County SIP in the Federal Register.

Brad explained that the SIP will be a 3-legged stool, including the rules and control measures recently adopted by ICAPCD, the Natural Events Action Plan (currently in draft form), and consideration of transport of emissions from Mexico.

Emissions and fugitive dust from the project have not been included in the emissions inventory or SIP at this point. The agency has not yet determined how emissions from this project will be factored into the inventory.

ICAPCD staff re-iterated that the rules and control measures recently adopted by ICAPCD were not written with this project in mind, and may require a second look with regard to the Salton Sea.

#### **11:15 Input on Draft Documents, DWR Approach to the Programmatic EIR, Topics for Future SSAQWG Meetings (All)**

Schedule and update from Chuck Keene:

The Ecosystem Restoration Study (ERS) will be more comprehensive and will provide more details than the PEIR. It will lay out decision making throughout the alternatives development process, and will provide more information on analysis of alternatives, feasibility, constructability, ability to meet habitat goals, cost estimates, etc. Public review is

not a requirement for the ERS, but the ERS will be an attachment to the PEIR, effectively opening the ERS for public review and comment. All of this will be part of the Administrative Record.

The Resources Agency hopes to allow for a 60-day public review. If draft PEIR is issued in March, the public review period might be extended to allow more time. If the issue date is later, the period may not be extended.

The Final PEIR is scheduled for issuance in October or November 2006. As part of the Final PEIR in December 2006, a finance plan (cash-flow analysis) will be submitted. This document would look at budgetary requirements and timing required for implementation of alternatives, as well as options and mechanisms for funding. However, the legislature will make decisions regarding allocations and sources of funding.

After the legislature acts, the program would move ahead to detailed impact studies to support a project-specific EIR.

Subsequent to 2006, various pilot studies and research efforts will take place (primarily related to habitat and air quality at the Sea). Partnerships and contracts with various entities and agencies (e.g., DRI, USBR, USGS, IID, ...) are being maintained and developed for this purpose.

#### **11:30 Observed Dust Clouds; Salty Soils (Al Kalin/Imperial County Farm Bureau)**

Mr. Kalin's presentation was titled "Future Problems with Air Quality Around the Salton Sea". He passed around samples of salt crust that he collected at the Sea, to demonstrate the powdery nature of the salts on the encrusted soil. He spoke about white dust he has personally experienced blowing under high wind events at the Sea, and presented photographs of what he has observed.

Mr. Kalin indicated that high wind events and annual dust storms off the desert in the area tend to occur during summer and fall. He felt that the storms tend to be worse in response to tropical storm systems in Mexico.

The Sea is shallow at both ends, around the river deltas, especially the Alamo River. Mr. Kalin showed aerial photographs of isolated playas that form where the fluctuating Sea has alternately flooded and exposed areas.

One area of concern to Mr. Kalin is at the New River outlet, where his photographs documented a dust storm that formed in this area on December 23, 2004. Photographs illustrated salty crusted areas in front of the New River outlet kicking up white clouds of dust at wind speeds between 15 and 25 mph. Blowing salt and dust eventually reached Mr. Kalin's house. In addition to human health concerns, Mr. Kalin pointed out the potential for salt and dust to impact the quality of crops, such as the valuable leafy vegetables (spinach and lettuces) grown in the area.

Other areas of concern are exposed shoreline areas along Davis Road. White, saline surfaces have been exposed as a result of annual fluctuations of the sea. Mr. Kalin reported that there was about a 1.5' reduction in Sea level since 1995. Wind events also shift water, raising elevation of downwind surfaces, and periodically flooding the shoreline.

The main problem observed by Mr. Kalin in the winter is associated with efflorescent (blooming) of salt on surficial crusts in response to wetting from rainfall, moisture air, and cooler temperatures. The efflorescent salts are very soft and powdery and will very likely blow under windy conditions.

DRI is interested in looking at these areas, and will contact Mr. Kalin. They reported that they have not measured emissions on areas with this type of salt crust. They will add locations like this to the next set of field measurement later this month.

November is annual low Sea level, and the peak Sea level is in May.

Mr. Kalin then presented some of his ideas for mitigation of salty soils and crusts. He indicated that there is "plenty of fresh water for the next 20 years". He suggests building temporary dikes "in the wet", with a dredge at the shallowest depths of the Sea that would float a dredge. The dikes would be used to hold back the "extra" freshwater flowing into the Sea, and the freshwater would be used to flush salts from the soils behind the dikes. He speculates that wave action would aid mixing, washing salt out of the soil. Control structures could be constructed to force salts through the dikes and into the Sea. It would be difficult to impossible to push salt down because of water logging. As sea recedes, the idea is to get freshwater water moving through cracks in the soil surface. If the first berm worked, as the Sea recedes, you could build a second berm, and flow water through the first berm. A series of berms could be constructed out into the Sea, transitioning from one bermed area to the next, as vegetation fills in the areas within the berms.

Based on his observations, Mr. Kalin described how soils may be deposited on the shoreline over time. With mixing, suspended clay and silt would be deposited on the receding beach line, creating a "generic soil" as the Sea recedes. He indicated that the first foot of exposed soil would "always be" this clay, as the sea recedes.

Freshwater from agricultural drains emptying directly into the Sea is already flushing salts from the soil and allowing plants to grow. An example he documented in photographs is located in an area where natural barnacle shoal (very porous) has impounded water behind it. After 3 to 4 years, fresh water has washed out salts and allowed many types of plants to grow in the area. Cattails and bulrushes are now common there.

Mr. Kalin indicated he has also seen evidence of freshwater reclaiming shallows when water is flushed through over years. He felt one could also could irrigate, and then drain the area, to remove salts.

This method would allow ways to reclaim soils, prior to exposure of these shoreline areas. The methods described may be a less expensive method for leaching salts from soils, requiring less machinery than perforated, subsurface drains. Once the salt is removed from soils, a larger selection of plants may grow and keep soils from moving or blowing.

Mr. Kalin acknowledged several possible issues associated with the use of freshwater to reclaim soils. They include:

- Mosquitoes (may be able to mitigate with mosquito fish)
- Pupfish connectivity (if dense hydrophytic vegetation develops, it could present a challenge)

- Selenium buildup in the sediment – Mr. Kalin indicated that Fig Lagoon is reportedly not that bad, and it has been relatively fresh for some time. If that is the case, why would selenium be a problem here?
- Cattails taking over – unlikely if areas are initially deep, then drained and too dry for cattails. Mr. Kalin reported that there are no cattails in the center of Fig Lagoon, where the water is deepest.

There is a possibility of reclamation of shoreline areas for agriculture, particularly where soils are sandy. The land in the area is very valuable, and farmers may be very interested in reclaiming these lands.

**12:00 to 1:00 pm (Lunch)**

**1:00 Construction-Related Air Quality Mitigation Requirements and Applicable Regulations (Pamela Vanderbilt/CH2M HILL, Air Agencies)**

See presentation. Pamela provided a summary of SCAQMD and ICAPCD rules, regulations, and requirements that will be applicable to the project, once an alternative is selected and implemented.

ICAPCD will review and comment on applicable General Conformity requirements. Reyes Romero indicated that their General Conformity rule might require emissions offsets (Rule 925).

Dr. Dickey described lessons learned from construction at Owens Lake. When constructing on playas, restriction of construction footprints is critical. Also, even in construction areas where best management practices (BMPs) are applied, pulverized crust and exposed sand sources will increase downwind sand motion and related emissions levels.

How far off the construction site are areas considered "adjacent" to construction? The ICAPCD regulations were not written with this project in mind, and may not sufficiently consider construction of this scale, on exposed playa. Brad Poirez indicated that in the future, ICAPCD may develop Sea-specific requirements, or a SIP specific to impacts from the Salton Sea (similar to the SIP that Great Basin AQMD has developed for impacts from Owens Lake).

**Update on DRI wind tunnel and PI-SWERL testing around Salton Sea (Mark Sweeny/DRI)**

DRI provided an update on their side-by-side testing of the PI-SWERL and the University of Guelph wind tunnel conducted in September 2005. Results show a nice correlation, with moderate correction factors for observable surface characteristics. Similar side-by-side tests have been conducted at Ft. Irwin. Results from use of the PI-SWERL are being calibrated to results from use of the wind-tunnel. Wind tunnel test methods are widely accepted.

DRI will conduct two additional rounds of testing with the PI-SWERL. One will be in late January, and the other will be in early March 2006.

All surfaces they observed in September were crusted and most could be characterized as "non-emissive". Surfaces tested in September had a wide range of salt contents, and DRI saw little evidence of dust. They were somewhat limited with regard to access to the near-

sea areas that could be tested. The sites they visited needed to be sufficiently large and stable to allow vehicle access with the truck and wind tunnel trailer, with room to do replicate wind tunnel tests.

For appropriate calibration of the two test methods, they felt they needed to cover the full spectrum of soils from around the Sea. There is a broad range of soil surface textures available.

Mark Sweeney described the test sites, indicating that soils were playa-like at 6 locations, 2 sites were ancient playa areas (east side of sea), 4 sites were beaches (ranging from barnacle-encrusted to sand), and one site was fluvial, with some dune land. DRI did report some difficulty with elevation measurements. The tests were typically within a few centimeters to a few feet of Salton Sea level at time of testing.

DRI intends to wait to complete a full write-up of results until all 3 data sets can be evaluated together.

In late January and March testing periods, DRI may see very different conditions. Rain and cooler temperatures may influence crust stability. It was recommended that DRI add a site similar to what Mr. Kalin described, where efflorescent salts appear to be very emissive.

DWR committed to immediate release of the draft DRI preliminary data report for the September test program and asked that the working group provide review and comments. DRI will also try to provide photographs of the areas tested.

#### **1:45 Draft Outline for Short-Term vs. Long-Term Research/Information Needs (John Dickey/CH2M HILL, All)**

Based on input from the group, we should add tillage (ridge tilling) to the list of dust control measures to be considered for surface stabilization under certain conditions.

In addition, we would need to continue to coordinate with air districts on plans for source monitoring and ambient air quality monitoring.

John discussed our current proposal to study use of gravel as a dust control measure as a feasibility study on paper. We need to look at issues related to sustainability, construction, and potential plant invasion of gravel, in addition to costs for gravel mining and hauling, geotextile liners, and installation of gravel blankets.

Additional studies of salt crusting and stabilization of soil surfaces (stabilization with brine), as well as chemical stabilization, will be conducted.

Dust control measures that appear feasible on paper will be pilot tested, first at small scale, and then at a larger, prototype scale.

#### **Update from Cheryl Rodriquez on USBR/GS work**

Topics for future Air Quality Working Group Meetings - Ask Pat Chavez to share his thoughts on the "big questions" sent to him by John Dickey last November.

Pat Chavez is working on a draft "vulnerability map" based on acoustic surveys of the Sea bottom, to be completed by end of this month. He would then finalize this map by February.



Cheryl remarked that the observations by Al Kalin correlate well with the MODIS satellite imagery Pat has been studying.

In addition to on-site video cameras that operate to film potential dust sites when wind speeds reach certain levels, Pat's team is looking at use of high-resolution images from aerial photographs taken on transects across crusted areas to estimate emissivity. He would like to ground truth these studies with simultaneous ground observations. Scheduled for the week after next, USBR, USGS, and SSSO will be looking at sites around the Sea for further study. Cheryl suggested that perhaps Al Kalin could help direct some of this field visit.

USBR has ceased further study of emissions emanating from off-highway vehicle use areas near the gypsum mine site southwest the Sea.

**2:30 Schedule Update. Discussion of Potential Phasing of Studies, Construction, and Future AQ Research (Chuck Keene/DWR)**

**3:00 Path Forward, Next Steps (Chuck Keene/DWR)**

Other topics for future meetings:

- Review of gravel efficiency as a control measure.
- Comparison and correlation of 2 and 10 m meteorological data collected at the sites we added to the CIMIS network. Preliminary indications are that there is decent correlation, but more information is needed. Will review status at next meeting.

The group voiced interest in a tour of Owens Lake dust mitigation program. Great Basin AQMD and LADWP participation would be desirable. (Suggested dates - April 24 and 25). Doug Barnum had previously suggested that we coordinate a meeting with Ted Schade from the Great Basin Unified Air Pollution Control District (Bishop), so this may be the opportunity to do so.

The group also voice interest in a tour of the Salton Sea. It was recommended that we do this at the meeting after next (July?).

In the meantime, Chuck requested input from the group as soon as possible on the interim deliverables from CH2M HILL and DRI. The group's input is critical to development of the best possible ERS products.

**3:30 Adjourn**

**DRAFT Summary of Alternatives and Assumptions**

Alternatives	Exposed Areas (acres)	Air Quality Mitigation Water Demand Assumed (ac ft/yr)	Saline Habitat (wetted acres)	Habitat Mitigation Water Demand Assumed <sup>a</sup> (ac ft/yr)	Estimated Material Required for Barriers, Dikes, and Berms (cubic yards)	Estimated Capital Cost (presented at Advisory Committee Meeting <sup>b</sup> 12/8/2005)
No Action	48,000	24,000	NA	NA	NA	\$1.1 B
Variability Baseline	108,000	54,000	NA	NA	NA	\$1.9 B
North Sea Combined	152,000	76,000	18,000	574,000	100.5 Million	\$10.0 B
South Sea Combined	152,000	76,000	18,000	574,000	77.3 Million	\$9.2 B
North Sea with Minimal Barrier	138,000	69,000	38,000	581,000	82.8 Million	\$9.8 B
Concentric Rings	144,000	72,000	NA	578,000	60.8 Million	\$7.9 B
Minimal Barrier	135,000	67,500	65,000	582,500	30 Million	\$7.3 B

<sup>a</sup> Includes water demand for marine sea, saline habitat complex, and treatment losses

<sup>b</sup> This cost estimate does not include operations and maintenance costs,

1/11/2006  
Salton Sea AQ Working Group

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